IN THE CLAIMS

Please cancel claims 25 – 27.

Please amend the claims to read as indicated herein.

1. (currently amended) Microlithography projection objective for short wavelengths, with an entrance pupil and an exit pupil for imaging an object field ~~in~~ into an image field in an image plane, which represents a segment of a ring field, wherein the segment has an axis of symmetry and an extension perpendicular to the axis of symmetry and the extension is at least 20mm, comprising:

a first (S1), a second (S2), a third (S3), a fourth (S4), a fifth (S5) and a sixth mirror (S6) in centered arrangement relative to an optical axis,

wherein each of these mirrors have an off-axis segment, in which the light beams traveling through the projection objective impinge, and

wherein the diameter of the off-axis segment of the first, second, third, fourth, fifth and sixth mirrors as a function of the numerical aperture NA of the objective at the exit pupil is ≤ (1200 mm * NA), and

wherein NA is greater than 0.2.

2. (currently amended) Microlithography projection objective according to claim 1, wherein ~~the numerical aperture NA at the exit pupil is greater than 0.1, and~~ the diameter of the off-axis segment of the first, second, third, fourth, fifth and sixth mirrors is ≤ 300 mm.

3. (currently amended) Microlithography projection objective ~~according to claim 1,~~ for short wavelengths, with an entrance pupil and an exit pupil for imaging an object field into an image field in an image plane, which represents a segment of a ring field, wherein the segment has an axis of symmetry and an extension perpendicular to the axis of symmetry and the extension is at least 20mm, comprising:

a first (S1), a second (S2), a third (S3), a fourth (S4), a fifth (S5) and a sixth mirror (S6) in centered arrangement relative to an optical axis,

wherein each of these mirrors have an off-axis segment, in which the light beams traveling through the projection objective impinge, and

wherein the diameter of the off-axis segment of the first, second, third, fourth, fifth and sixth mirrors as a function of the numerical aperture NA of the objective at the exit pupil is ≤ (1200 mm * NA),

wherein the first, second, third, fourth, fifth and sixth mirrors each have a volume claim on the rear side of the mirror, which has a depth parallel to the optical axis measured from the front side of the mirror in the off-axis segment,

wherein the depth of the volume claims of the first, second, third, fourth, and sixth mirrors is at least 50mm, and the depth of the volume claim of the fifth mirror is greater than 1/3 the value of the diameter of the fifth mirror, and

wherein the respective volume claims are not penetrated.

4. (previously presented) Microlithography projection objective according to claim 3, wherein all volume claims can be extended in a direction parallel to the axis of symmetry without intersecting the light path in the objective or the volume claim of another mirror.

5. (previously presented) Microlithography projection objective according to claim 1,

wherein the first, second, third, fourth, fifth and sixth mirrors include an edge region encircling the off-axis segment, and the edge region amounts to more than 4 mm, and

wherein the light is guided in the objective free of obscuration.

6. (previously presented) Microlithography projection objective according to claim 1, wherein the off-axis segment of the fourth mirror is arranged geometrically between the second mirror and the image plane.

7. (previously presented) Microlithography projection objective according to claim 1, wherein the fourth mirror is arranged geometrically between the third and the second mirrors.

8. (previously presented) Microlithography projection objective according to claim 1, wherein the fourth mirror is arranged geometrically between the first and the second mirrors.

9. (previously presented) Microlithography projection objective according to claim 1, wherein the distance of the mirror vertex along the optical axis from the fourth to the first mirrors (S4 S1) relative to the distance from the second to the first mirror (S2 S1) lies in the range:

$$0.1 < (S4\ S1) / (S2\ S1) < 0.9.$$

10. (currently amended) Microlithography projection objective according to claim 1, wherein the distance of the mirror vertex along the optical axis from the third to the ~~second~~ fourth mirror ~~(S2 S3)~~ (S3 S4) relative to the distance from the ~~fourth~~ second to the third mirror ~~(S4 S3)~~ (S2 S3) lies in the range:

$$0.3 < (S3\ S4) / (S2\ S3) < 0.9.$$

11. (currently amended) ~~Microlithography projection objective according to claim 1,~~ Microlithography projection objective for short wavelengths, with an entrance pupil and an exit pupil for imaging an object field into an image field in an image plane, which represents a segment of a ring field, wherein the segment has an axis of symmetry and an extension perpendicular to the axis of symmetry and the extension is at least 20mm, comprising:

a first (S1), a second (S2), a third (S3), a fourth (S4), a fifth (S5) and a sixth mirror (S6) in centered arrangement relative to an optical axis,

wherein each of these mirrors have an off-axis segment, in which the light beams traveling through the projection objective impinge, and

wherein the diameter of the off-axis segment of the first, second, third, fourth, fifth and sixth mirrors as a function of the numerical aperture NA of the objective at the exit pupil is ≤ (1200 mm * NA), and

wherein the central ring-field radius R, as a function of the numerical aperture NA at the exit pupil, the distance of the mirror vertex along the optical axis from the fifth to the sixth mirror (S5 S6), the distance of the mirror vertex of the fifth mirror from the image plane (S5 B), and the radii of curvature r_5, r_6 of the fifth and sixth mirrors is:

$$R \geq \tan(\arcsin(NA)) * \left[(S5\ B) + (S5\ S6) - \frac{1}{\frac{2}{r_6} - \frac{1}{r_5 + (S5\ S6)}} \right].$$

12. (previously presented) Microlithography projection objective according to claim 1, further comprising an angle of incidence of a chief ray of a field point,

wherein the field point lies on the axis of symmetry in the center of the object field, and

wherein the angle of incidence is < 18° on all mirrors.

13. (previously presented) Microlithography projection objective according to claim 1, wherein an intermediate image is formed in the projection objective in the light direction after the fourth mirror (S4).

14. (previously presented) Microlithography projection objective according to claim 1, further comprising a diaphragm (B) that is arranged in a light path or a beam path on the second mirror (S2).

15. (previously presented) Microlithography projection objective according to claim 1, wherein the first mirror is made convex, and the first, second, third, fourth, fifth and sixth mirrors are aspheric.

16. (previously presented) Microlithography projection objective according to claim 1, wherein the first mirror has zero base curvature, and the first, second, third, fourth, fifth and sixth mirrors are aspheric.

17. (previously presented) Microlithography projection objective according to claim 1, wherein the first mirror is concave and the first, second, third, fourth, fifth and sixth mirrors are aspheric.

18. (previously presented) Microlithography projection objective according to claim 1, wherein all mirrors are aspheric.

19. (previously presented) Microlithography projection objective according to claim 1, wherein five mirrors at most are aspheric.

20. (original) Microlithography projection objective according to claim 19, wherein the fourth mirror is spherical.

21. (currently amended) Microlithography projection objective according to claim 1, wherein the second mirror (S2) to the sixth ~~mirrors (S2-S6)~~ mirror (S6) are configured in the sequence: concave – convex – concave – convex – concave.

22. (previously presented) Microlithography projection objective according to claim 1, wherein the objective is telecentric on the image side.

23. (previously presented) Projection exposure system, comprising:
an illumination device for illuminating a ring field; and
a projection objective according to claim 1.

24. (previously presented) Process for chip manufacture comprising using a projection exposure system according to claim 23.

25. (canceled)

26. (canceled)

27. (canceled)

Please add the following claims, newly numbered as claims 28 through 47.

28. (new) Microlithography projection objective according to claim 3,
wherein the first, second, third, fourth, fifth and sixth mirrors include an edge region encircling the off-axis segment, and the edge region amounts to more than 4 mm, and
wherein the light is guided in the objective free of obscuration.

29. (new) Microlithography projection objective according to claim 3, wherein the off-axis segment of the fourth mirror is arranged geometrically between the second mirror and the image plane.

30. (new) Microlithography projection objective according to claim 3, wherein the fourth mirror is arranged geometrically between the third and the second mirrors.

31. (new) Microlithography projection objective according to claim 3, wherein the fourth mirror is arranged geometrically between the first and the second mirrors.

32. (new) Microlithography projection objective according to claim 3, wherein the distance of the mirror vertex along the optical axis from the fourth to the first mirrors (S4 S1) relative to the distance from the second to the first mirror (S2 S1) lies in the range:

$$0.1 < (S4\ S1) / (S2\ S1) < 0.9.$$

33. (new) Microlithography projection objective according to claim 3, wherein the distance of the mirror vertex along the optical axis from the third to the fourth mirror (S3 S4) relative to the distance from the second to the third mirror (S2 S3) lies in the range:

$$0.3 < (S3\ S4) / (S2\ S3) < 0.9.$$

34. (new) Microlithography projection objective according to claim 3, wherein the central ring-field radius R, as a function of the numerical aperture NA at the exit pupil, the distance of the mirror vertex along the optical axis from the fifth to the sixth mirror (S5 S6), the distance of the mirror vertex of the fifth mirror from the image plane (S5 B), and the radii of curvature r_5, r_6 of the fifth and sixth mirrors is:

$$R \geq \tan(\arcsin(NA)) * \left[(S5\ B) + (S5\ S6) - \frac{1}{\frac{2}{r_6} - \frac{1}{r_5 + (S5\ S6)}} \right].$$

35. (new) Microlithography projection objective according to claim 3, further comprising an angle of incidence of a chief ray of a field point,

wherein the field point lies on the axis of symmetry in the center of the object field, and

wherein the angle of incidence is < 18° on all mirrors.

36. (new) Microlithography projection objective according to claim 3, wherein an intermediate image is formed in the projection objective in the light direction after the fourth mirror (S4).

37. (new) Microlithography projection objective according to claim 3, further comprising a diaphragm (B) that is arranged in a light path or a beam path on the second mirror (S2).

38. (new) Microlithography projection objective according to claim 3, wherein the first mirror is made convex, and the first, second, third, fourth, fifth and sixth mirrors are aspheric.

39. (new) Microlithography projection objective according to claim 3, wherein the first mirror has zero base curvature, and the first, second, third, fourth, fifth and sixth mirrors are aspheric.

40. (new) Microlithography projection objective according to claim 3, wherein the first mirror is concave, and the first, second, third, fourth, fifth and sixth mirrors are aspheric.

41. (new) Microlithography projection objective according to claim 3, wherein all mirrors are aspheric.

42. (new) Microlithography projection objective according to claim 3, wherein five mirrors at most are aspheric.

43.added) Microlithography projection objective according to claim 42, wherein the fourth mirror is spherical.

44. (new) Microlithography projection objective according to claim 42, wherein the second mirror (S2) to the sixth mirror (S6) are configured in the sequence: concave – convex – concave – convex – concave, respectively.

45. (new) Microlithography projection objective according to claim 42, wherein the objective is telecentric on the image side.

46. (new) Projection exposure system, comprising:
an illumination device for illuminating a ring field; and
a projection objective according to claim 3.

47. (new) Process for chip manufacture comprising using a projection exposure system according to claim 46.